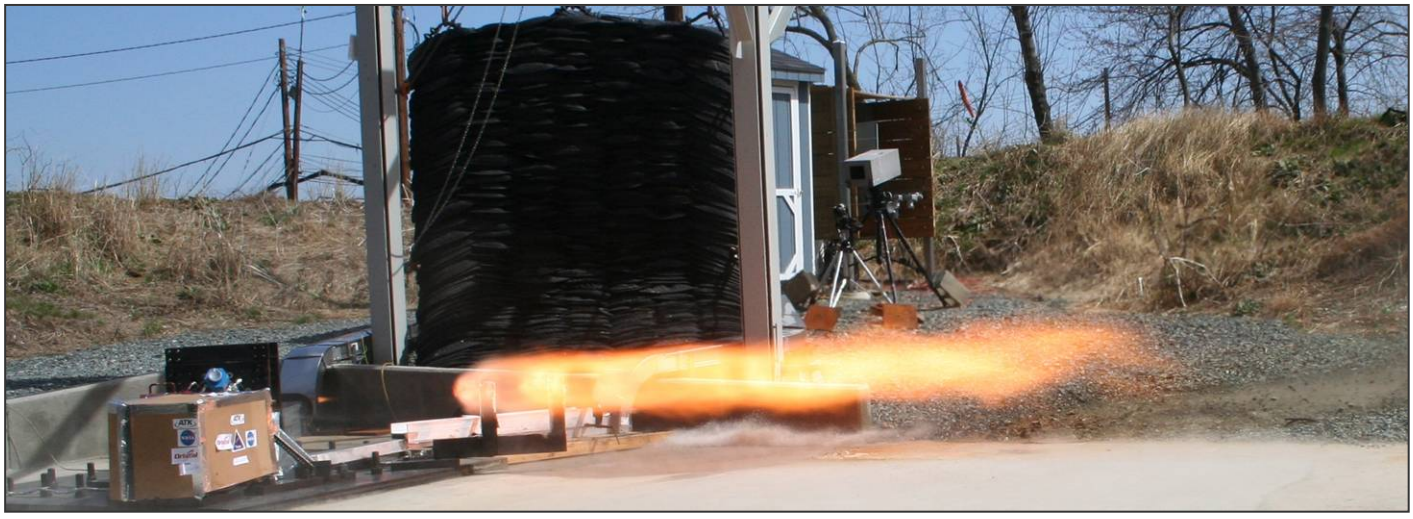
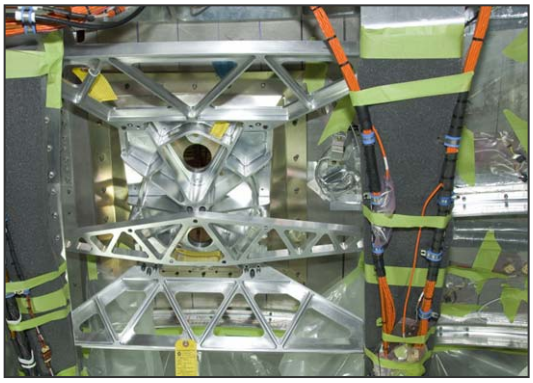
Orion Crew Exploration Vehicle Weekly Accomplishments

Week ending March 27, 2009



NASA, and industry partners Lockheed Martin Corporation, Orbital Sciences Corporation and ATK successfully performed a ground test firing of a sub-scale attitude control motor thruster system for the launch abort system (LAS). The test was conducted at ATK's facility in Elkton, MD on March 31. This demonstration, High Thrust-8 (HT-8), was the fifth in a series of ground tests of Orion's attitude control motor system and provided validation that several flight-weight subsystems are performing as designed. The final tests will be of increasing complexity in preparation for the Pad Abort-1 (PA-1) Flight Test, which will test the integrated launch abort system's capabilities in actual flight conditions. Orion's attitude control motor will provide steering for the launch abort system. The immediate assessment of the test team is that HT-8 met all planned test objectives. Initial test article inspections indicate the hardware looks very good with only minor adjustments indicated prior to the next test. Data analysis is ongoing; however the initial performance results were as expected.

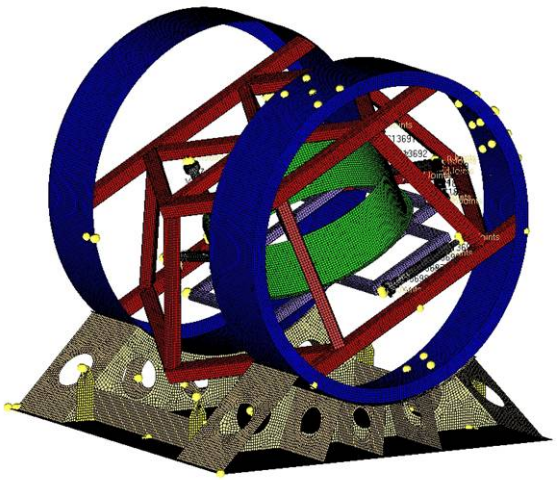


The PA-1 Forward Bay (FBC) Cover 0 degree 180 deg antenna bracket support structure is complete (see picture top right). Langley Research Center (LaRC) technicians completed the modifications at Dryden Research Center and will install the T-0 door.

The Pad Abort 1 T-0 thermal and electrical doors (flight set) arrived at Dryden Flight Research Center (Photo bottom right). LaRC technicians will incorporate the FBC hardware (CLA-5) fixes, install both T-0 doors, and support the gusset and bulkhead ballast (CLA-5 driven) modifications.

The Crew Exploration Vehicle Thermal Protection System (TPS) team held the heatshield downselection recommendation panel meeting to discuss the strengths and weaknesses of both the PICA and the Avcoat TPS systems. The panel unanimously recommended to downselect to Avcoat. This decision was ratified and formally accepted by the CEV Project Control Board.

The Abort Motor reduced thrust deformed grain structural analysis is complete. ATK established a MEOP of 1500 psi. It was decided to increase the internal insulation thickness based on the margins observed from the ST-1 test. This will decrease the propellant weight for the flight system, though the weight impact has not been determined. Igniter design is expected to be completed by next week. ATK's Nozzle Integrated Product Team is also working to re-size the throats and determine the throat profile for the reduced thrust.



The Landing and Recovery System team developed a LS-Dyna dynamic simulation model (Diagram left) for the Crew Impact Attenuation System test article. The model will be used to select initial set of test cases for the "system of struts" drop tests and includes the structure of the test article, pallet, crew mass, and Langley wire bender struts (see figure left). Results from several selected test cases were run to provide predictions of struts loads and displacements.

A crew evaluation of the Low Impact Docking System (LIDS) Guide Petal Mockup folding mechanism was completed. The result was an end item change of a single visual indicator on the mechanism to indicate petals deployed and locked and that this indicator is not required to be viewed from the docking hatch window.

Communications and Public Engagement

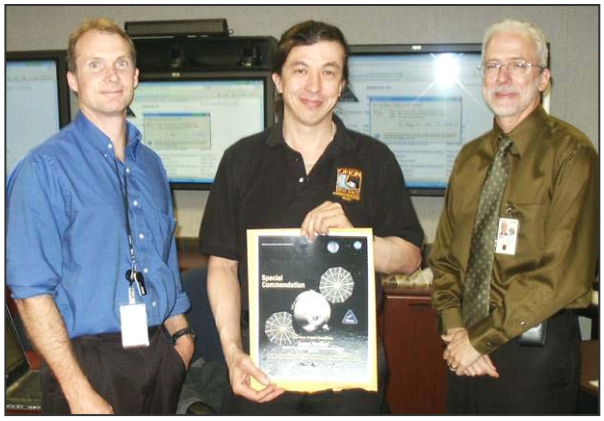
Congresswoman Gabrielle Giffords toured the facilities of Orion Lockheed Martin subcontractor Paragon Space Development Corp. in Tucson, AZ. During the tour Giffords toured the 16,000-square-foot facility where Orion spacecraft components will be made and visit with some of Paragon's employees. Over 30 guests attended, including the Mayor of Tucson and representatives from the University of Arizona. Media coverage of this event included: Reuters, Associated Press, a CNN affiliate, and FOX, taking footage as well as CBS, NBC, and ABC

A full-scale mockup of the Orion crew module was displayed on the Mall in Washington, D.C. on its way to Kennedy Space Center for at-sea testing to evaluate floatation characteristics and recovery operations. Following is some of the positive coverage about Orion making progress toward its first crewed mission in 2015: http://www.nasa.gov/multimedia/imagegallery/image_feature_1318.html

CNN: http://www.cnn.com/2009/TECH/space/03/30/orion.spacecraft.washington/index.html?iref=24hours
UPI: http://www.upi.com/Science_News/2009/03/25/NASA_tests_Orion_recovery_procedures/UPI-55491238016510/
Reuters: http://www.reuters.com/article/idUSTRE52T6XH20090330

Former NASA Astronaut & FOX News contributor Tom Jones presented a close-up view of the Orion crew module mockup at Johnson Space Center, live on FOX NEWS this morning.
http://www.foxnews.com/video2/video08.html?maven_referralObject=4130158&maven_referralPlaylistId=&sRevUrl=http://www.foxnews.com/index.html

Larry Price, Lockheed Martin Orion deputy program manager, recently accepted a Business Recognition Award on behalf of Lockheed Martin at the Jefferson Economic Council's Annual Industry Awards Breakfast in Arvada, Colorado. Lockheed Martin was nominated by the City of Lakewood, Colorado and highlighted the 600 jobs that Lockheed Martin has brought to Colorado through its work on NASA's Orion crew exploration vehicle project.



Mark Geyer and Charlie Lundquist presented a special commendation to James Reuther in thanks and recognition of his outstanding leadership of the TPS ADP (Photo right).